

AUDIT OF ENOXAPARIN DOSING POST-OPERATIVELY IN MAXILLO-FACIAL SURGERY PATIENTS UNDERGOING FLAP PROCEDURES

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Introduction:

Following accidental administration of two doses of LMWH (low molecular weight heparin) in the first 24 hours post-surgery, there was an unplanned return to theatre for arrest of haemorrhage and haematoma evacuation. On the same day and separate patient, another case of two doses appearing on the electronic medicine administration chart was spotted and amended before two doses could be given in the first 24 hours post-surgery. It was clear this was a serious incident and furthermore raised the question of whether overdosing of enoxaparin had occurred with other patients and whether this would have a direct impact on flap success.

Flap success rates are historically reported between 90-99%¹, however, flap loss is a serious complication and can be due to thrombus formation. Hence, anticoagulants are given for flap patency and venous thromboembolism (VTE) thromboprophylaxis. Other common post-operative complications include haemorrhage, haematoma and infection.^{2,3,4}

- ❑ To determine the quantity of patients who were given incorrect doses of anticoagulants in the first day post-surgery
- ❑ To highlight the impact on flap survival and patient safety
- ❑ To facilitate a standardised protocol for future patients

100% compliance to UCLH VTE thromboprophylaxis policy

Exceptions: Patients with altered dose with haematology advice

Head and neck cancer patients with reconstructive flap procedures between 01/09/2020 - 30/11/2020 at UCLH under all maxillo-facial consultants

Current protocol - locally and nationally:

- No evidence for VTE thromboprophylaxis in head and neck cancer patients undergoing surgery +/- reconstruction with a (free) flap
- Current guidance is based on evidence from abdominal surgery⁵

International protocol:

- No standardised regimens
- Anticoagulants commonly used: aspirin, dalteparin, unfractionated heparin, LMWH, prostaglandin, dextran¹

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Objectives

Re-audit

Standard

UCLH VTE thromboprophylaxis – 10/11/20

- Enoxaparin 50-100kg: 40 mg SC OD

Solutions

Dose adjustments (empirical)	
Renal impairment CrCL (Cr&S) 20-30ml/min (DW coagulation SpR if CrCL <20ml/min)	Reduce to 20mg SC OD, but take into consideration: • Degree of renal impairment • Risk of bleeding • Thrombosis risk factors
< 50kg/ frail elderly: 20mg SC OD 100-149kg: Suggest 40mg SC BD	150-200kg: Suggest 60mg SC BD > 200kg: DW coagulation SpR
Head and Neck (Oral / maxillofacial / ENT surgery)	• Consider prophylactic dose SC enoxaparin 6-8 hours post-op if no concerns re bleeding, consider extending for a minimum of 7 days when the risk of VTE outweighs the risk of bleeding • Consider ACE (IPC on admission) if increased risk of VTE and high risk of bleeding that precludes use of enoxaparin; continue until mobility no longer significantly reduced ¹ relative to normal anticipated mobility

Selection Criteria

Conclusions

Results

- 18 patients over 3 month period
- 9 patients (50%) incorrect dose delivered
 - 7 with double the dose required
 - 5 of which were free flaps
 - 2 with half the dose required
- 1 near miss
- 13 of 18 patient operative notes specified the time of dosing for 6 hours post-op
- 10 of the 18 patients had documented complications post-surgery
- 1 flap loss due to congestion, with correct dose of enoxaparin delivered

- Clear specification of LMWH time and dose in operative notes by surgeon
- ITU and nursing staff to check medication record to prevent double dosing
- Add alert to electronic medication administration system for double dose and/or overdosing of medication
- Education of staff on individual dosing based on VTE risk assessment
- Further research into the impact of pharmacological VTE thromboprophylaxis
- Develop a new protocol for head and neck cancer flap reconstruction patients

- Small sample of patients
- High incidence of incorrect dosing of enoxaparin in the first 24 hours post-surgery
- Risk of post-operative complications: haematoma and haemorrhage
- Potential causes for double dosing: late sign-out of surgery meaning first dose in early hours of day 1 post-surgery and ITU delivering standard evening dose in addition to post-operative dose on the same day
- However, with a lack of national and international evidence, it is unclear whether this level of dosing is significant in success of flap procedures.

References:

- Swartz JE, Aarts MC, Swart KM, et al. The value of postoperative anticoagulants to improve flap survival in the free radial forearm flap: a systematic review and retrospective multicentre analysis. *Clin Otolaryngol*. 2015;40(6):600-609. doi:10.1111/coa.12425
- Barton BM, Riley CA, Fitzpatrick JC, Hasney CP, Moore BA, McCool ED. Postoperative anticoagulation after free flap reconstruction for head and neck cancer: A systematic review. *Laryngoscope*. 2018 Feb;128(2):412-421. doi: 10.1002/lary.26703. Epub 2017 Jun 5. PMID: 28581030.
- Eley KA, Parker RJ, Watt-Smith SR. Low molecular weight heparin in patients undergoing free tissue transfer following head and neck ablative surgery: review of efficacy and associated complications. *Br J Oral Maxillofac Surg*. 2013 Oct;51(7):610-4. doi: 10.1016/j.bjoms.2013.01.017. Epub 2013 Apr 10. PMID: 23583006.
- Zhou, W., Zhang, W.-B., Yu, Y., Wang, Y., Mao, C., Guo, C.-B., ... Peng, X. (2017). Risk factors for free flap failure: a retrospective analysis of 881 free flaps for head and neck defect reconstruction. *International Journal of Oral and Maxillofacial Surgery*, 46(8), 941-945. doi:10.1016/j.ijom.2017.03.023
- NICE. Venous thromboembolism in over 16s: reducing the risk of hospital-acquired deep vein thrombosis or pulmonary embolism NICE guideline [NG89] Published date: 21 March 2018 Last updated: 13 August 2019. Available at <https://www.nice.org.uk/guidance/ng89> [Accessed on 02/01/2021]

No conflicts of interests for both authors.